DECISION DOCUMENT FOR THE APPROVAL OF OHIO'S SUBMISSION OF THE STATE'S INTEGRATED REPORT WITH RESPECT TO SECTION 303(d) OF THE CLEAN WATER ACT (CATEGORY 5 WATERS)

The U.S. Environmental Protection Agency has conducted a complete review of Ohio's 2012 Section 303(d) list and supporting documentation and information, and based upon this review U.S. EPA has determined that Ohio's list of assessment units (AU's) still requiring total maximum daily loads (TMDLs) meets the requirements of Section 303(d) of the Clean Water Act (CWA or Act), and U.S. EPA's implementing regulations. Therefore, U.S. EPA hereby approves Ohio's 2012 Section 303(d) list. Ohio's list of AUs still requiring TMDLs appears in Category 5 of the Ohio 2012 Integrated Water Quality Monitoring and Assessment Report (2012 Integrated Report or 2012 IR), and U.S. EPA's approval extends only to the AUs in Category 5 of the Integrated Report. The statutory and regulatory requirements, and U.S. EPA's review of Ohio's compliance with each requirement, are described in detail below.

I. Statutory and Regulatory Background

Identification of Water Quality Limited Segments (WQLSs) for Inclusion on Section 303(d) List

Section 303(d)(1) of the Act directs states to identify those waters within its jurisdiction for which effluent limitations required by Section 301(b)(1)(A) and (B) are not stringent enough to implement any applicable water quality standard, and to establish a priority ranking for such waters, taking into account the severity of the pollution and the uses to be made of such waters. The Section 303(d) listing requirement applies to waters impaired by point and/or nonpoint sources, pursuant to U.S. EPA's long-standing interpretation of Section 303(d).

U.S. EPA regulations provide that states do not need to list waters where the following controls are adequate to implement applicable standards: (1) technology-based effluent limitations required by the Act; (2) more stringent effluent limitations required by state or local authority; and (3) other pollution control requirement required by state, local, or federal authority. (40 C.F.R. §130.7(b)(1))

Consideration of Existing and Readily Available Water Quality-Related Data and Information

In developing Section 303(d) lists, states are required to assemble and evaluate all existing and readily available water quality-related data and information, including, at a minimum, consideration of existing and readily available data and information about the following categories of water: (1) waters identified as partially meeting or not meeting designated uses, or as threatened, in the state's most recent Section 305(b) report; (2) waters for which dilution

calculations or predictive models indicate nonattainment of applicable standards; (3) waters for which water quality problems have been reported by government agencies, members of the public, or academic institutions; and (4) waters identified by the state as impaired or threatened in a nonpoint assessment submitted to U.S. EPA under Section 319 of the Act. (40 C.F.R. §130.7(b)(5)) In addition to these minimum categories, states are required to consider any other data and information that is existing and readily available. U.S. EPA's 1991 Guidance for Water Quality-Based Decisions (1991 Guidance), describes categories of water quality-related data and information that may be existing and readily available. While states are required to evaluate all existing and readily available water quality-related data and information, states may decide to rely or not rely on particular data or information in determining whether to list particular waters.

In addition to requiring states to assemble and evaluate all existing and readily available water quality-related data and information, U.S. EPA regulations require states to include as part of their submissions to U.S. EPA documentation to support decisions to rely or not rely on particular data and information and decisions to list or not list waters. This documentation needs to include, at a minimum, the following information: (1) a description of the methodology used to develop the list; (2) a description of the data and information used to identify waters; (3) a rationale for any decision to not use any existing and readily available data and information; and (4) any other reasonable information required by the Region. (40 C.F.R. §130.7(b)(6))

Priority Ranking

U.S. EPA regulations also clarify and interpret the requirements in Section 303(d)(1)(A) of the Act that states establish a priority ranking for listed waters. In prioritizing and targeting waters, states must, at a minimum take into account the severity of the pollution and the uses to be made of such waters and shall identify the pollutants causing or expected to cause violations of the applicable water quality standards. The priority ranking shall specifically include the identification of waters targeted for TMDL development in the next two years. (40 C.F.R. §130.7(b)(4)) As long as these factors are taken into account, states have discretion in prioritizing waters for TMDL development. States may consider other factors relevant to prioritizing waters for TMDL development, including immediate programmatic needs, vulnerability of particular waters as aquatic habitats, recreational, economic and aesthetic importance of particular waters, degree of public interest and support, and state or national policies and priorities found in 57 Fed. Reg. 334040, 33045 (July 24, 1992), and U.S. EPA's 1991 Guidance.

Identification of Waters and Consideration of Existing and Readily Available Water Quality-Related Data and Information

The Ohio 303(d) list of prioritized impaired waters (i.e., Category 5 of the 2012 Integrated Report) is contained in Section L4 of the 2012 Integrated Report, and is in compliance with

Section 303(d) of the Act and 40 C.F.R. §130.7. U.S. EPA has reviewed Ohio's description of the data and information it considered, its methodology for identifying waters, and considered any other relevant information including information the State submitted to U.S. EPA in response to requests for additional information. U.S. EPA concludes that the State of Ohio properly assembled and evaluated all existing and readily available data and information, including data and information relating to the categories of waters specified in 40 C.F.R. §130.7(b)(5).

U.S. EPA has also determined that the State properly listed waters with nonpoint sources causing or expected to cause impairment, consistent with Section 303(d) of the Act and U.S. EPA guidance. Section 303(d) lists are to include all water quality limited segments (WQLSs) still needing TMDLs, regardless of whether the source of the impairment is a point and/or nonpoint source. U.S. EPA's long-standing interpretation is that Section 303(d) applies to waters impacted by point and/or nonpoint sources. In *Pronsolino v. Marcus*, the Ninth Circuit Court of Appeals held that Section 303(d) of the CWA authorizes U.S. EPA to identify and establish total maximum daily loads for waters impaired by nonpoint sources.[1]

In 2003, Ohio passed a credible data law, in the Ohio Revised Code (ORC) 6111.50 to 6111.56, that establishes requirements for the use of external data. That law requires the Director of Ohio EPA to adopt rules that would, among other things, require that data be collected by a qualified data collector and be compliant with the specifications of "Level 3 credible data," in order to be used for listing waters under Section 303(d). Those rules, effective March 24, 2006, are located at Chapter 3745-4 of the Ohio Administrative Code (OAC). Within Section D5 of the 2012 Integrated Report is the memorandum dated June 6, 2011, sent by Ohio to solicit Level 3 data from external sources and all Level 3 Qualified Data Collectors (QDC). External sources include State and County health departments, universities, US Geological Survey, Northeast Ohio Regional Sewer District (NEORSD), permittees, compliance databases, and atrazine registrants. The data collectors either received intensive training and certification from Ohio EPA to become QDC, or the entities have submitted data in the past.

As part of its ongoing monitoring and assessment program, the State developed a five-year rotating basin plan that divides the State into 25 areas each comprised of a group of subbasins within major river basins. Ohio EPA estimates that under the current funding levels monitoring takes more than 10 years to complete throughout the State. After the State completes the monitoring in one of the assessment areas, it collects the data and assesses the biological, chemical, and physical condition of the AU.

[1] Pronsolino et al. v. Nastri et. al., 291 F. 3d 1123 (9th Cir, 2002); see also U.S. EPA's 1991 Guidance; and National Clarifying Guidance for 1998 Section 303(d) Lists, August 27, 1997.

The Ohio River data collection is through the Ohio River Valley Water Sanitation Commission (ORSANCO). The Commission was established in 1948 and operates programs to improve water quality (through wastewater discharge standards, biological assessments, monitoring chemical and physical properties), coordinates emergency response for spills or accidental discharges, and promotes public participation in volunteer programs. Ohio defers to ORSANCO's analysis and listing of impaired Ohio River segments, which is discussed in greater detail later in this document.

II. Analysis of Ohio's Submission

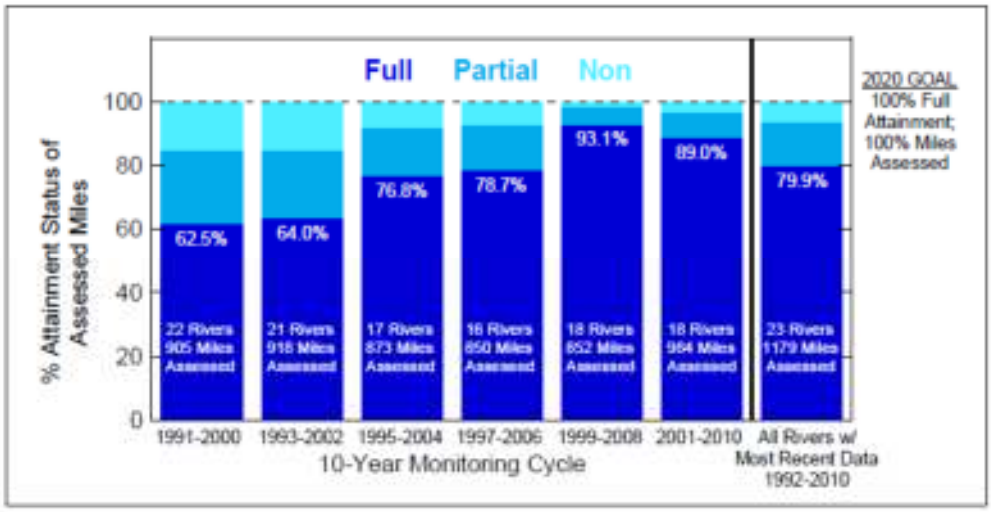
Listing Methodology and Reporting

U.S. EPA issued guidance for integrating the development and submission of Section 305(b) water quality reports and Section 303(d) lists of impaired waters (U.S. EPA's 2002 Integrated Water Quality Monitoring and Assessment Report Guidance, November 19, 2001) (2001 Guidance). The 2001 Guidance was superseded by U.S. EPA's Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act, July 21, 2003 (2003 Guidance). The 2003 Guidance recommends that states develop an integrated report of the quality of their waters by placing all waters into one of five assessment categories. On August 12, 2005, the 2006 Integrated Report Guidance (2006 IRG) became available. In a memorandum dated October 12, 2006, from the Office of Wetlands, Oceans, and Watersheds, all Regions were instructed to follow the 2006 IRG in preparing the 2008 IR. There was supplemental guidance in 2008, a memorandum dated May 5, 2009, and the latest memorandum , *Information Concerning 2012 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions*, is dated March 21, 2011. These memoranda and guidance were available for the preparation and review of Ohio's 2012 Integrated Report.

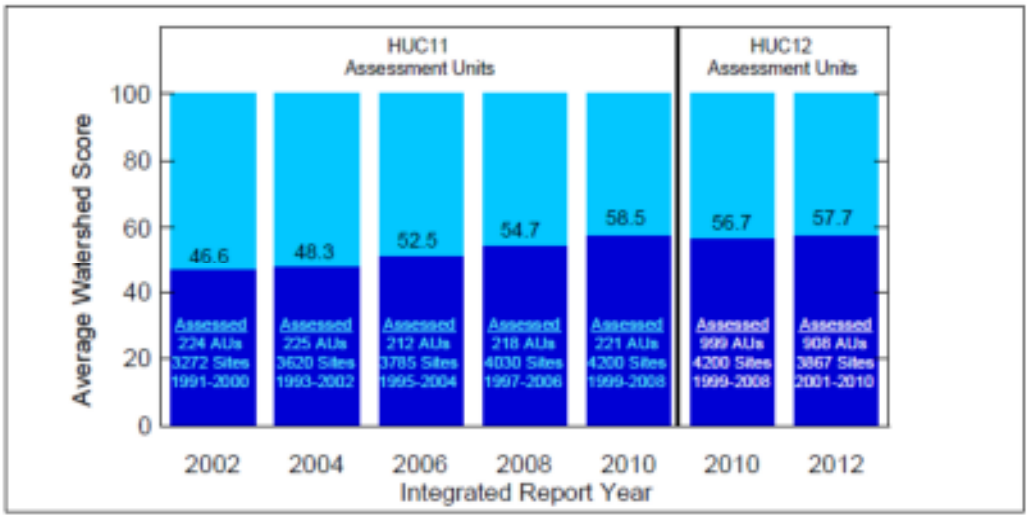
The waterbodies in Category 5, at Section L4 of Ohio's 2012 IR, constitute the State's Section 303(d) list. Ohio's 2012 list includes significant changes compared to the 2010 listing cycle. There are several key issues that have evolved that impact Ohio's assessment program. Details are found within Ohio's 2012 IR, and several modifications are highlighted and discussed below. The most significant overall additions and enhancements to the 2012 IR are discussions of the western Lake Erie basin algal blooms, wetlands assessment, the impact of Great Lakes Restoration Initiative (GLRI) on Ohio projects, Harmful Algal Blooms (HAB) and their related cyanotoxins, and Grand Lake St. Marys. Several sections are not discussed in this document when there was not a significant departure from past monitoring and assessment.

Section A: An Overview of Water Quality in Ohio. This Section assesses the changes in status of Ohio's waters since the last listing, including progress toward overall goals. One of the larger goals of the program is that 100% of the waters of large rivers (23 rivers in 38 assessment units) will be assessed and attaining water quality goals by 2020. The current year can be readily

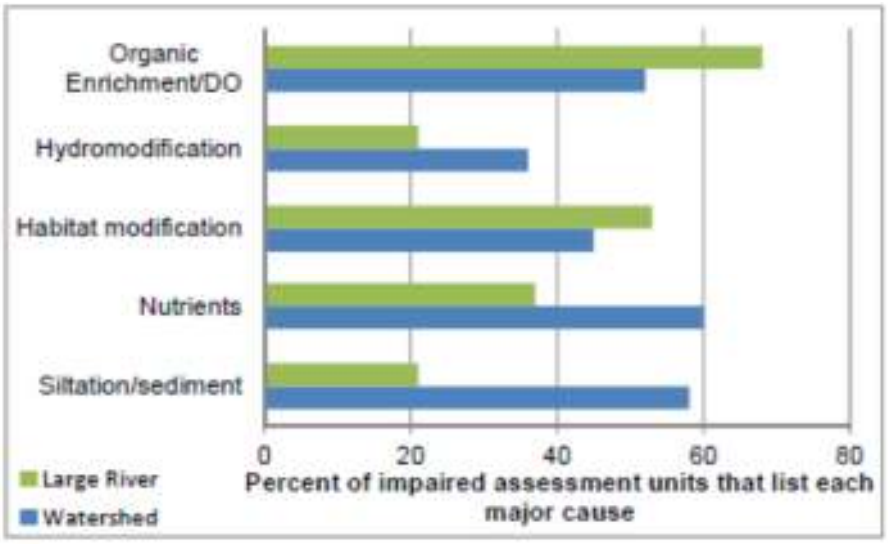
compared with the 2010 IR for 18 large rivers. The figure below represents the attainment status of the large rivers. A total of 89.0% of the assessed miles of large rivers are in full attainment. The apparent decrease in full attainment from 93.1% is due to the new assessment of four more large urban rivers not included in the last listing cycle, as well as exclusion of data greater than 10 years old. The final column represents all data for all rivers from 1992-2010. Summary information on the individual AUs is available at: http://epa.ohio.gov/dsw/tmdl/2012IntReport/assessment summaries.aspx.



The figure below represents the overall percentages of the watershed assessment units (WAUs). A total of 57.7% of the 908 assessed AUs are in full attainment, a similar number to the last listing cycle. These assessments are further discussed and compared in the Section G review in this document.



The major causes of impairment are organic enrichment/low dissolved oxygen (OE/DO), hydromodification, habitat modification, nutrients, and siltation/sediment. The figure below shows that prevalence of OE/DO impairment in both watershed assessment units and large rivers. The figure below is taken from Section A of the 2012 IR.



Section C: Managing Water Quality. This Section describes various water quality management programs including surface water programs such as water quality standards, TMDLs, NPDES permits, and point and non-point source programs. The Section also includes a description of Lake Erie programs including both historic and current steps being taken in Lake Erie assessment. These efforts include the ongoing Remedial Action Plans (RAPs) in the Areas of Concern (AOCs) and Lake Erie Lakewide Management Plan (LaMP) efforts on the shores and in the tributaries. Ohio EPA is actively monitoring the lake, having initiated a *Comprehensive Nearshore Monitoring Program* in 2011 that will continue for several years using Great Lakes Restoration Initiative (GLRI) funding, with results to be summarized in the 2014 IR. The effort ties in with the RAPs, LaMPs, and the Great Lakes Water Quality Agreement (GLWQA) between the United States and Canada. The goal of the new monitoring program is to establish the baseline to integrate Lake Erie monitoring into Ohio EPA's Water Quality Monitoring Strategy. Additional ambient sites and parameters, and evaluation of biological communities will be added to the 2010 National Coastal Condition Assessment. Future work will also extend beyond the shoreline to include harbors, bays, and estuaries.

The Section also discusses modification of the assessment for Ohio's Section 401 Certification. The CWA requires state certification as part of the permitting process, and provides states the authority to protect its waters. Ohio may review and then approve, conditionally approve, or deny all Federal permits or licenses that might result in a discharge to its waters, including

wetlands. Ohio can decide whether activity will violate effluent limitations, new source performance standards, toxic pollutants, or other water resources. In the Ohio Administrative Code (OAC), rules for the 401 review process are found in Section 3745-1-5 Stream Antidegradation, 3745-01-50 thru 54 (Wetland Water Quality Standards), and 3745-32-1 thru 7 (Water Quality certification). Ohio has authorized that applicants must provide three alternatives for each proposed project: a preferred, minimal degradation, and non-degradation alternative. These alternatives are considered to minimize impacts on current aquatic resources and evaluate future mitigation sites. After review, Ohio may determine that water quality may be reduced, but waters may not violate standards. Coordination with the state upfront is encouraged, as well as inclusion of 10 specific items within the applications before review may begin.

Since the last reporting cycle, several wetland studies and assessments have begun. They include the Cuyahoga River watershed, urban wetlands, a comparison of the ecological condition of 25 mitigation wetlands to natural wetlands, and use of a GIS tool to identify potential vernal pool habitat restoration areas.

Section D: Framework for Reporting and Evaluation – Ohio continues to use the watershed orientation from previous reports and with a framework for assessment using the four designated uses: Aquatic Life Use, Recreation, Human Health, and Public Drinking Water Supply (PDWS). The assessment units for the 2012 IR have not changed significantly from the 2010 IR. The three types of assessment units are: Watershed Assessment Units (WAU) for the streams, Large River Assessment Units (LRAU) for the large rivers, and Lake Erie is assessed in three units, the nearshore western basin, the nearshore central basin, and the Lake Erie Islands. Reporting and evaluation are completed by the Ohio EPA and outside entities that are certified as Level 3 qualified collectors, described previously in this document. Data may be chemical, physical, or biological. Ohio defers to ORSANCO for the Ohio River listings.

Public involvement is also a large component of Ohio's listing framework. A matter of great public interest and concern in this listing cycle is the excessive algal bloom issue in the western Lake Erie basin, as expressed in the public comment letters included in Section D. Ohio's responses show that it is both aware of the problem and is taking actions that include monitoring, data assessment, and the listing of nearshore waters and islands of Lake Erie. Ohio has not listed the open waters of Lake Erie as impaired for algae because Ohio does not have methodology to assess the trophic state of open waters. The nearshore and islands are listed for nutrients based on aquatic life use impairment and exceedance of the narrative standard that waters shall be "free from nutrients entering the water as a result of human activity in concentrations that create nuisance growth of aquatic weeds and algae;…." (OAC 3745-1-04 (E)). There are TMDLs which have been completed, others currently under development, and plans for future TMDLs to quantify and reduce contributions of nutrients from tributaries that flow into the lake. More details are found later in this document in the Lake Erie Listing Section. Several comments were

also submitted regarding wetlands, Grand Lake St. Marys, inland lakes, mercury and PCBs and these comments were adequately addressed by Ohio EPA.

Section F: Evaluating Beneficial Use - Recreation. The LRAU, WAU, inland lakes, and Lake Erie Basin (Western, Central and Lake Erie Islands) were evaluated for recreational use. Table F-1, found later in this document, shows that water quality standards are based on the amount of human contact with the various waterbody types, i.e., bathing water, primary contact waters and secondary contact waters. *E. coli* standards are expressed as a seasonal geometric mean of 126 cfu/100ml during the recreational season; the single sample maximum is 235 cfu/100ml. Ohio states in Section F that beach advisories for each beach are based on "… exceedance of the single sample maximum *E. coli* criterion for beaches of 235 cfu/100 ml. This is the threshold that triggers the issuance of beach advisories, and has been used since 2006. Use of the single sample maximum *E. coli* criterion for the purpose of issuing beach advisories complies with the federal BEACH Act rule (*Water Quality Standards for Coastal and Great Lakes Recreation Waters*, 69 FR 67217, November 16, 2004), which became effective on December 16, 2004." (2012 IR, F-9) This value is also used by health departments. Whenever this threshold was exceeded more than 10% of the recreational season from late May through early September, Ohio listed the beach as being in non-attainment (Table F-2 below). Section F also has tables that provide an overview of the various assessments for determining recreational use impairment for Lake Erie beaches.

Table F-2. Determining assessment status of Lake Erie shoreline AUs.

Lake Erie AU Assessment Status	Attainment Status of Individual Beaches
Full	Frequency of advisory postings less than 10% of recreation season for all of the beaches in the AU for all years assessed
Non	Frequency of advisory postings more than 10% of recreation season for one or more of the beaches in the AU for one or more of the years assessed

Table F-10 below shows the 63 Lake Erie beaches divided into the three geographical areas. The recreational season closings and the percentage of days in exceedance of *E. coli* from 2006-2010 are shown to be 16.8% of recreation days closings for the Western Basin, 21.8% for the Central Basin, and less than 0.1% for the Lake Erie Islands. Though this table provides an overall picture based on a compilation of data, there is great variation depending on data analysis (whether the seasonal geometric mean or the single sample maximum was exceeded). Further, there are great differences amongst: individual beaches; different seasons at the same beach, and; the number of seasons used in the analysis.

Table F-10. Bathing water geometric mean *E. coli* exceedance frequency at 63 Lake Erie public beaches from 2006-2010 (pooled by Lake Erie AU to report use support).

	Western Basin	Central Basin	Lake Erie Islands
Number of beaches	16	45	2
Total recreation days	5,598	16,300	901
Total days in exceedance	940	3552	8
Percentage of days in exceedance	16.8%	21.8%	<0.1%
Average # of days *E. coli* criteria exceeded per beach per season[1]	11.8	15.8	0.8
Attainment status	Does not support	Does not support	Full support

[1] Calculated by dividing the total days in exceedance in a basin by the number of beaches in the basin, then dividing that result by the number of seasons (5) from which the exceedance data were obtained.

Table F-12 below shows the trend for the 2012 listing cycle compared to 2010 for rivers and streams (LRAUs and WAUs). For the 588 AUs analyzed for the 2012 report, 15% fully supported recreational use while 85% did not, based on the 1,576 total AUs assessed.

Table F-12. Overall differences in the assessment of recreation use attainment, 2010-2012.

	2010 Report		2012 Report	
	Number	Percent	Number	Percent
Total AUs	1,576	100	1,576	100
Assessed	487	31	588	37
Not Assessed	1,089	69	988	63
Supporting Recreation Use	65	13[a]	88	15[a]
Not Supporting Recreation Use	422	87[a]	500	85[a]

[a] Percentage of AUs reported as supporting the recreation use and not supporting the recreation use are based on the total AUs that were assessed (e.g., 487 in the 2010 analysis).

Beaches at inland lakes are tested less frequently compared to Lake Erie beaches, and are not exceeding the bacteria limits as frequently as Lake Erie. The overall frequency of exceedences at inland lakes was 8.4% in a five year interval. The main exception was the inland lake Grand Lake St. Marys, where over 60% of the samples collected during the 2010 recreation season exceeded the single sample criterion. Ohio recommends more beach sampling at recreational locations where beach managers know that exceedences may cause harm via human contact with the water through bathing or swimming, and can adequately inform the public.

Section G: Evaluating Beneficial Use – Aquatic Life Use (ALU). Table G-1 on the following page indicates that overall the WAUs achieving ALU changed slightly from 56.7% to 57.7% for the HUC 12 assessments (shown in the Figure in Section A above). Overall, the LRAUs achieving ALU changed from 93.1% to 89.0%, and the three Lake Erie AUs show that 30.4% of the sites are in full attainment for ALU. The increase in full attainment (from14.7% to 30.4%) is due to the omission of 11 outdated sites from Lake Erie (following Ohio's credible data rules) in 1999 and 2000, representing approximately one-third of available data. This omission resulted

in a large change in attainment values. The Sandusky, Cuyahoga, Scioto, and Great Miami Rivers had detailed assessments completed since the last listing cycle, and some of the older Auglaise data were dropped from the analysis.

Table G-1. Summary of aquatic life use assessment for Ohio's watershed[1], large river, and Lake Erie assessment units: 2002-2012 Integrated Report cycles.

IR Cycle	2002 (1991-2000)	2004 (1993-2002)	2006 (1995-2004)	2008 (1997-2006)	2010 (1999-2008)	2012 (2001-2010)
HUC11 Watershed AUs (331)						
No. AUs Assessed (% total)	224 (68%)	225 (68%)	212 (64%)	216 (66%)	221 (67%)	-
No. Sites Assessed	3272	3620	3785	4030	4200	-
Average AU Scores						
Full Attainment	46.6	48.3	52.5	54.7	58.5	-
Partial Attainment	25.2	23.6	22.6	22.4	21.2	-
Non-Attainment	26.2	26.1	24.9	22.9	20.3	-
HUC12 Watershed AUs (1538)						
No. AUs Assessed (% total)[2]	-	-	-	-	999 (65%)	908 (59%)
No. Sites Assessed	-	-	-	-	4200	3867
Average AU Score[3]	-	-	-	-	56.7	57.7
% Sites Full Attainment	-	-	-	-	55.1	57.0
% Sites Partial Attainment	-	-	-	-	20.0	21.6
% Sites Non-Attainment	-	-	-	-	24.9	21.4
Large River AUs (23 rivers/38 AUs totaling 1227.14 Miles)						
No. Rivers (AUs) Assessed	22	21	17	16	18 (30)	18 (31)
No. Sites Assessed	422	425	374	278	265	312
No. Miles Assessed (% miles)	905 (70%)	918 (71%)	873 (68%)	850 (66%)	852 (69%)	984 (80%)
% Miles Full Attainment	62.5	64.0	76.8	78.7	93.1	89.0
% Miles Partial Attainment	23.0	21.4	15.1	13.9	5.5	7.5
% Miles Non-Attainment	14.5	14.6	8.1	7.4	1.4	3.5
Lake Erie AUs (3)						
No. AUs Assessed	3	3	3	3	3	3
No. Sites Assessed	92	111	93	49	34	23
% Sites Full Attainment	12.0	18.0	19.4	10.2	14.7	30.4
% Sites Partial Attainment	13.0	14.4	16.1	22.4	17.7	30.4
% Sites Non-Attainment	75.0	67.6	64.5	67.4	67.6	39.2

1 WAUs for the IR 2002-2010 cycles were based on HUC11s; WAUs transitioned to HUC12s for the IR 2010 and 2012 cycles.

2 2010 statistics based on direct assessment of HUC12 AUs with data collected between 2005 and 2008 (n=545) and HUC11 extrapolated assessment of HUC12 AUs with data collected between 1998 and 2004 (n=454). 2012 assessments based on direct assessment of HUC12 AUs with data collected between 2001 and 2010 (n=908).

3 Statistic based on the average of available AU scores with current data, derived as explained in Section G2.2.

A new focus of the state's Lake Erie monitoring is a project for 2011-2013 to design and implement monitoring of nearshore sites, including bays, harbors, and lacustuaries, through Great Lakes Restoration Initiative (GLRI) funding. Some of the results will be available for use in the 2014 listing cycle.

Section I: Considerations for Future Lists. Of growing concern since the last listing cycle are the increasing occurrences of Harmful Algal Blooms (HAB) from Cyanobacteria, commonly called blue-green algae. HABs are increasing spatially and temporally in this country and around the

world. HABs produce cyanotoxins that affect the skin, liver or nervous system, or can deplete oxygen levels for aquatic life due to biomass from excessive algal blooms. These algae are very adaptable to many water conditions and may experience rapid growth, especially when excess phosphorus is introduced to a water body. The cyanotoxins are recognized to be a hazard to humans, animals, and ecosystems by many agencies, including the U.S. EPA, the Center for Disease Control, and the World Health Organization (WHO). The WHO has developed risk-based thresholds for adults for recreation and drinking water uses.

HABs have been especially acute in the western basin of Lake Erie and Grand Lake St. Marys. Ohio states in the 2012 IR: "As incidents of HABs have increased, Ohio's response has evolved. In 2008, a HAB workgroup consisting of representatives of state and federal agencies, academia and volunteers was formed. Ohio Department of Natural Resources (ODNR), Ohio Department of Health (ODH) and Ohio EPA developed the State of Ohio Initiative to Address HABs in Ohio's Inland Lakes and Lake Erie and a state-wide algal toxin sampling program. A HAB steering committee was formed in November 2010 to further refine Ohio's HAB response strategy and develop a consistent sampling methodology, terminology, algal toxin thresholds, and advisory protocols." (2012 IR, I-13)

In 2011 Ohio released a strategy to protect people from the toxins in public recreational waters. Advisories are posted when there may be a risk for human health and illness. Two inland lakes, Grand Lake St. Marys and Cutler Lake, had advisory postings in 2011. Human illness, dog illness, and dog deaths occurred in 2010 that met the definition for the "probable case" that algal toxins were the cause of the illness and death.

Section I also discusses algal toxin monitoring results in recreational waters, drinking water, and fish tissue. The National Lake Survey monitoring detected high levels of various algal toxins in Grand Lake St. Marys. Two Ohio agencies, the Ohio EPA and ODNR, increased sampling sites to include Grand Lake St. Marys and other inland lakes, state park beaches, and drinking water intakes. The types of toxins added to microcystin analysis include cylindrospermopsin, saxitoxin and anatoxina. Monitoring results are available at www.ohioalgaeinfo.com. Algal toxins in the City of Celina's drinking water intake from Grand Lake St. Marys were 23% higher in 2011 than in 2010. The City of Celina continues to treat and test its finished water and has had no detection of microcystin in finished water since testing began in 2009. The problems within Grand Lake St. Marys are being addressed using multiple methods, including in-lake alum treatment, removal of sediment at tributaries, removal of rough fish, requiring farmers to develop nutrient management plans to try to reduce phosphorus going into the lake and the analysis of fish for microcystin.

In addition to the Ohio EPA's monitoring of public water systems (PWS) on Lake Erie and inland lakes, eight PWS voluntarily monitor water intake and finished water for algal toxins. Though algal toxins have been detected in the source waters, the toxins have not been detected in

finished drinking water. However, there is a large cost for treating water contaminated with toxins. Ohio EPA is developing educational materials to assist drinking water facilities with algal issues.

U.S. EPA does not have well-established fish tissue methodology for analyzing cyanobacterial algal toxins, with results used to determine acceptable human consumption rates and human health hazards. Ohio EPA is continuing further analysis for sampling microcystin algal toxin in fish fillets, and measurements have been 0.2 ppb, far below the current Ohio "do not eat" fish advisory level of 28 ppb.

Section J: Addressing Waters not Meeting Water Quality Goals – Section J reviews and summarizes the listing framework, explains the prioritization and delisting process and results, and reports on Ohio's TMDL program and schedule for TMDL development and monitoring. Table J-4 below from the 2012 IR includes the attainment, impairment, or unknown status in each designated use category. New for this listing cycle is subcategory "t", which includes waters for which a TMDL has been completed. This is further broken into subcategories of waters which are attaining designated uses, and waters for which the attainment status is unknown.

Table J-1. Category definitions for the 2012 Integrated Report and 303(d) list.

Category[1]		Subcategory	
0	No waters currently utilized for water supply		
1	Use attaining	h	Historical data
		t	TMDL complete; AU is now attaining water quality standards
		x	Retained from 2008 IR
2	Not applicable in Ohio system		
3	Use attainment unknown	h	Historical data
		i	Insufficient data
		t	TMDL complete; included in TMDL(s) for other units, but there may be no or not enough data to assess this unit
		x	Retained from 2008 IR
4	Impaired; TMDL not needed	A	TMDL complete
		B	Other required control measures will result in attainment of use
		C	Not a pollutant
		h	Historical data
		n	Natural causes and sources
		x	Retained from 2008 IR
5	Impaired; TMDL needed	M	Mercury
		h	Historical data
		x	Retained from 2008 IR

[1] Shading indicates categories defined by U.S. EPA; additional categories and subcategories are defined by Ohio EPA.

Table J-4. Summary of results for each beneficial use[1].

	Human Health (Fish Contaminants)	Recreation	Aquatic Life	Public Drinking Water
Watershed assessment units				
Not being used for public water supply	0	0	0	1421
Attains	180	102	312	36
Unknown	850	671	247	76
Impaired, needs TMDL	508	421	537	4
Impaired, TMDL complete	0	344	387	1
Impaired, other remedy	0	0	0	0
Impaired, not pollutant	0	0	6	0
Impaired, natural condition	0	0	49	0
Total watershed units evaluated	1538	1538	1538	1538
Large river assessment units				
Not being used for public water supply	0	0	0	29
Attains	1	1	14	2
Unknown	2	18	0	4
Impaired, needs TMDL	35	15	18	3
Impaired, TMDL complete	0	4	3	0
Impaired, other remedy	0	0	0	0
Impaired, not pollutant	0	0	3	0
Total large river units evaluated	38	38	38	38
Lake Erie assessment units				
Attains	0	1	0	3
Unknown	0	0	0	0
Impaired, needs TMDL	3	2	3	0
Total Lake Erie units evaluated	3	3	3	3

[1] Reported using federally-defined categories (see Table J-1), except for two defined by Ohio (category 0 (not being used for public water supply) and subcategory 4n (impaired due to natural condition)). Other Ohio-defined subcategories are included in federal categories.

Section M: An Overview of Ground Water Quality in Ohio – Section M reviews programs that monitor, evaluate, and protect ground water. Table M-2 below from the 2012 IR includes data from entities that report and summarize ground water contamination by facility. These include the federal National Priorities List (NPL), CERCLIS (Comprehensive Environmental Response, Compensation, and Liability Information System), DOD/DOE, Leaking Underground Storage Tanks (LUST), RCRA Corrective Actions, and Underground Injection.

Table M-2. Ground water contamination summary.
Hydrogeologic Setting: Statewide
Data Reporting Period: As of September, 2011

Source Type	Number of sites	Number of sites that are listed and/or have confirmed releases	Number of sites with confirmed ground water contamination	Contaminants
NPL	35	35	31	Mostly VOCs and heavy metals; also, SVOCs, PCBs, PAHs and others
CERCLIS (non-NPL)	402	402	58	Varied
DOD/DOE	124[a]	68	68	Varied
LUST	32,613[b]	1,231	660[d]	BTEX
RCRA Corrective Action	130	130	130	VOCs, heavy metals, PCBs, and others
Underground Injection	Class[e] I - 10 II - 385 III - 47 IV - 0 V - 50,000+	 0 0 0 0 NA	 0 0 0 0 NA	
State Sites[c]	752	617	246[f]	Varied
Nonpoint Sources	NA	NA	NA	

Notes:
NA - Numbers not available
[a] Includes DOE, DOD, FUSRAP and FUD sites
[b] Includes only active LUST sites. Source: Ohio's Bureau of Underground Storage Tank Regulations
[c] Sites in Tier 2 or Tier 3 cleanup stages. Source: Ohio's Bureau of Underground Storage Tank Regulations
[e] Class II and Class III injection wells regulated by the Ohio Department of Natural Resources. Class IV injection wells are illegal in Ohio. The total number of Class V injection wells in Ohio is unknown.
[d] Facilities in Ohio EPA's Ground Water Impacts database
[f] A site is considered to be contaminating ground water if the "Uppermost Aquifer" or "Lower Aquifer" is noted to be impacted, found in Ohio EPA's Ground Water Impacts database

Figure M-2 below shows sites that have been assessed to have groundwater impacts from various sources, including storage tanks, storage drums, landfills, site wide issues, spills, surface impoundments, underground storage tanks, waste pile pits, and others. The highest priority sources are fertilizer applications, manure applications, material stockpiles, storage tanks, surface impoundments, landfills, septic systems, shallow injection wells, hazardous waste sites, and urban runoff (stormwater management). Analyses include inorganic and organic pesticides, halogenated solvents, petroleum compounds, nitrate, fluoride, salinity, metals, radionuclides, bacteria, protozoa, viruses, and VOCs.

A Maximum Contamination Limit (MCL) exceedance is used as the criterion for determining impairment of public water systems (PWS) or wells. A location is included on the "watch list" if the measured value is 50% to 100 % of the MCL. Ohio includes impaired and watch list distribution maps for arsenic, iron and manganese, and nitrate. These contaminants are found in treated water originating from groundwater aquifers that supply PWS as shown in Figures M-3, M-4 and M-5 below.

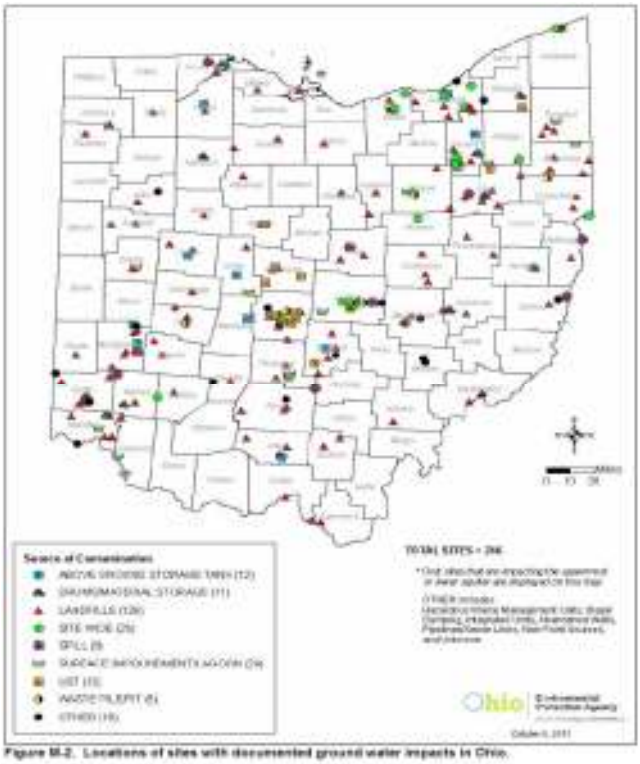


Figure M-2. Locations of sites with documented ground water impacts in Ohio.

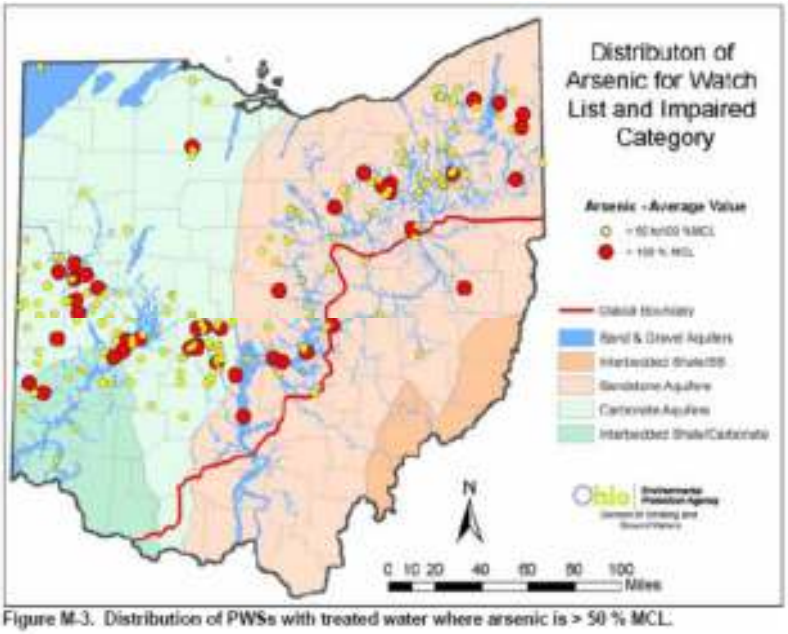


Figure M-3. Distribution of PWSs with treated water where arsenic is > 50 % MCL.

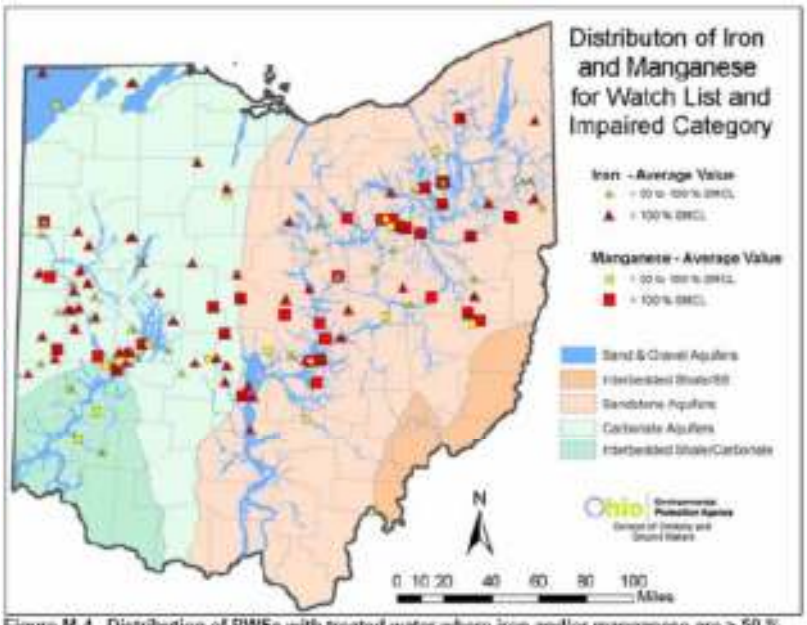


Figure M-4. Distribution of PWSs with treated water where iron and/or manganese are > 50 % MCL.

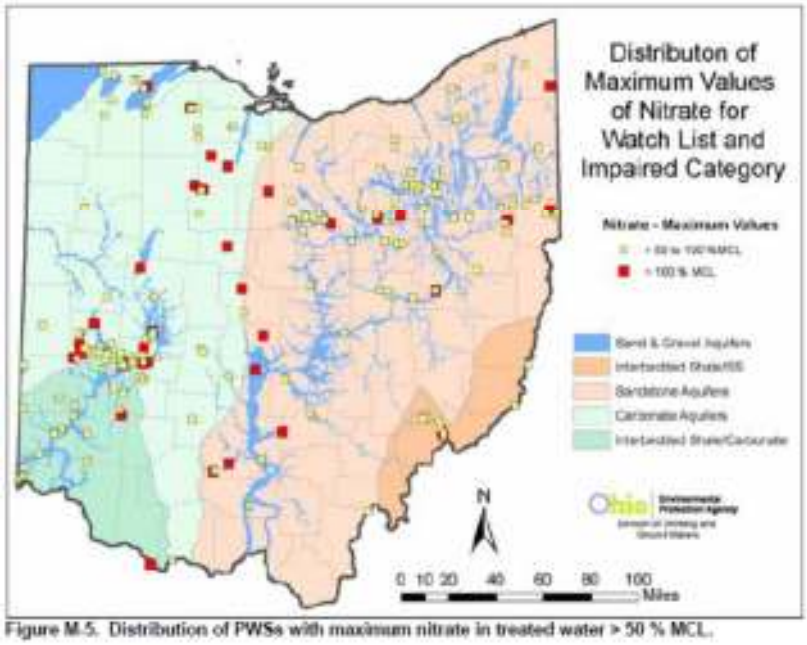


Figure M-5. Distribution of PWSs with maximum nitrate in treated water > 50 % MCL.

Ohio River Listing

The AUs associated with the main stem of the Ohio River are assessed by the Ohio River Valley Water Sanitation Commission (ORSANCO), which reports its findings in a Section 305(b) report. ORSANCO is an interstate agency charged with abating pollution in the Ohio River Basin and preventing future degradation of its waters. ORSANCO was established in 1948 through the signing of the Ohio River Valley Water Sanitation Compact by representatives of the eight member states. Through this Compact, ORSANCO has been given authority to develop the Section 305(b) report for the Ohio River. Ohio participates in the ORSANCO workgroup to promote consistency between 305(b) reporting and 303(d) listing. In the past, Ohio EPA has incorporated ORSANCO's listing of impaired waters into its Integrated Report for those portions of the Ohio River located within the State of Ohio. Section D4 of the 2012 Integrated Report states that ORSANCO has listed the impaired segments of the Ohio River in its Section 305(b) report, and that Ohio EPA defers to that list of impaired segments found in the *2010 Biennial Assessment of Ohio River Water Quality Conditions* (ORSANCO 2010). These waters are incorporated into Ohio's 303(d) list by reference.

Lake Erie Listings

The 2012 Integrated Report assesses the aquatic life use status of the Lake Erie shoreline in three assessment units: western basin nearshore, central basin nearshore, and islands. The "nearshore" is defined as within 100 meters of the shoreline. The term "lacustuary" specifies the zone where Lake Erie water levels have intruded into tributary river channels. The aquatic life use status of a lacustuary is included in the assessment of the tributary river.

Ohio used narrative standards to determine aquatic life use impairments for the nearshore and lacustuary zones. In 1997, Ohio completed *Development of Biological Indices Using Macroinvertebrates in Ohio Nearshore Waters, Harbors, and Lacustuaries of Lake Erie in Order to Evaluate Water Quality*. In 1999, Ohio produced *Biological Monitoring and an Index of Biotic Integrity for Lake Erie's Nearshore Waters.* The data in these documents provide a foundation to establish numeric biocriteria for aquatic life in the Lake Erie AUs. Assessment for attainment of recreational water quality standards for the three Lake Erie AUs was based upon examination of *E. coli* data provided by the Ohio Department of Health. For Lake Erie beaches 126 cfu/100 ml is the seasonal geometric mean standard and the single sample maximum is 235cfu/ml.

All three Lake Erie AUs, the western basin shoreline, including Maumee and Sandusky Bays, the central basin shoreline, and the Lake Erie Islands shoreline are listed in Category 5 in Section L4 of the 2012 IR for impairment of designated uses for the protection of human health, recreation, and aquatic life. The open waters of Lake Erie are not monitored by OEPA and were not assessed for impairment.

U.S. EPA's Great Lakes National Program Office (GLNPO) has monitored several sites in the open waters of the western basin for parameters relevant to HAB, such as phosphorus, chlorophyll a, and other algal-related data; the GLNPO information was submitted to Ohio EPA in correspondence from U.S. EPA dated February 6, 2012 (see Section D6 of the 2012 IR). U.S. EPA recommended that Ohio include the open waters of Lake Erie on its 2012 list based on the GLNPO data. In its response, Ohio stated that the data were submitted after Ohio's deadline for this listing cycle (see Section D of the 2012 IR). Ohio declined to use the data due to the late submittal. U.S. EPA accepts Ohio's rationale for not using the data for this listing cycle. However, in Section D-6 of the IR, Ohio EPA states that after assessing the GLNPO data it will consider including Lake Erie on the 303(d) list in 2014. Ohio's decision may also take into consideration future data submittals, methodology, regulatory authority, and shared responsibility with other states.

Water Quality Standards

Ohio water quality standards have two elements: designated uses, and numeric and narrative criteria designed to protect and measure attainment of the uses (OAC 3745-1-07(A)). A water body may have more than one use designation. Each water body in the State is assigned an aquatic life habitat use designation, and may also be assigned a water supply use designation and/or one recreational use designation (OAC 3745-1-07(A)(1)). Ohio has multiple sub-categories or tiers in its aquatic life use designation system (coldwater, seasonal salmonid, exceptional warmwater, warmwater, and modified warmwater habitats, and limited resource waters) (OAC 3745-1-07(B)(1)). Ohio water quality standards include three categories for both the recreational (bathing waters, primary contact and secondary contact recreation) and water supply (public, agricultural, and industrial) use designations. The Ohio Administrative Code contains statewide chemical-specific criteria for the support of use designations (OAC 3745-1-07(A)(2)). The following table is taken from Section D2 of the 2012 Integrated Report, and shows the designated uses, beneficial use categories, attributes of the category, and evaluation status for the 2012 IR.

Table D-1. Ohio water quality standards in the 2012 Integrated Report.

Beneficial Use Category	Key Attributes (why a water would be designated in the category)	Evaluation status in 2012 Integrated Report
Categories for the protection of aquatic life		
Coldwater Habitat	native cold water or cool water species; put-and-take trout stocking	Assessed on case by case basis
Seasonal Salmonid Habitat	supports lake run steelhead trout fisheries	No direct assessment, streams assessed as EWH or WWH
Exceptional Warmwater Habitat	unique and diverse assemblage of fish and invertebrates	59% of the WAUs and 82% of the LRAUs fully assessed using direct comparisons of fish and macroinvertebrate community index scores to the biocriteria in Ohio's WQS; sources and causes of impairment were assessed using biological indicators and water chemistry data
Warmwater Habitat (WWH)	typical assemblages of fish and invertebrates	
Modified Warmwater Habitat	tolerant assemblages of fish and macro-invertebrates; irretrievable condition precludes WWH	
Limited Resource Waters	fish and macroinvertebrates severely limited by physical habitat or other irretrievable condition	Assessed on case by case basis
Categories for the protection of recreational activities		
Bathing Waters	Lake Erie (entire lake); for inland waters, bathing beach with lifeguard or bathhouse facility	Lake Erie public beaches fully evaluated; nine inland lakes evaluated
Primary Contact Recreation	waters suitable for one or more full-body contact recreation activity such as wading and swimming; three classes are recognized, distinguished by relative potential frequency of use	56% of the AUs assessed using applicable PCR geometric mean *E. coli* criteria
Secondary Contact Recreation	waters rarely used for recreation because of limited access; typically located in remote areas and of very shallow depth	Assessed as part AU using applicable SCR geometric mean *E. coli* criteria
Categories for the protection of water supplies		
Public Water Supply	waters within 500 yards of all public water supply surface water intakes, publically owned lakes, waters sued as emergency supplies	Sufficient data were available to assess 42% of the 129 AUs with PDWS use; assessed using chemical water quality data; only waters with active intakes were assessed
Agricultural Water Supply	water used, or potentially used, for livestock watering and/or irrigation	Not assessed
Industrial Water Supply	water used for industrial purposes	Not assessed

Human Health: Ohio explains the linkage of water chemistry, fish tissue contaminants, and FCAs in Section E2 of the 2012 IR for human health standards development. WQS are based on the concentration of chemicals in water, but because the chemicals are known to bioaccumulate in fish, chemical measurements in fish tissue are taken into account for WQS development and for listing. A FCA advises the amount of fish from those waters that may safely be consumed and still protect human health.

There are criteria for six contaminants, mercury, PCBs, chlordane, DDT, mirex and hexachlorobenzene for assessing attainment of the human health designated use related to fish consumption, with data used from both fish tissue and the water. These contaminants may bioaccumulate in fish and fish tissue used to determine whether a fish consumption advisory (FCA) is warranted for the protection of human health. Decisions on whether to list these waters are dependent on individual conditions (See Table E-1 below). The FCA may be considered by the state when making a listing decision, but listing is not based solely on that waterbody having

a FCA. For example, if a fish consumption advisory is less protective than the WQS, the waterbody will be listed as impaired; if the advisory is more protective and the WQS is not exceeded, the water may not be listed even if it has a FCA (See Figure E-1 below).

Table E-1. Comparison between fish concentration values and FCA program values.

Basin / Parameter	Fish concentration on which the WQS is based [1]	Range of fish concentrations triggering an "eat no more than one meal per week" advisory	Range of fish concentrations triggering an "eat no more than one meal per month" advisory
Lake Erie / PCB	23 µg/kg	50 - 220 µg/kg	221 - 1,000 µg/kg
Ohio River / PCB	54 µg/kg	50 - 220 µg/kg	221 - 1,000 µg/kg
Lake Erie / mercury	350 µg/kg	110 - 220 µg/kg	221 - 1,000 µg/kg
Ohio River / mercury	1,000 µg/kg	110 - 220 µg/kg	221 - 1,000 µg/kg
Lake Erie / DDT	140 µg/kg	500 - 2,188 µg/kg	2,189 – 9,459 µg/kg
Ohio River / DDT	320 µg/kg	500 - 2,188 µg/kg	2,189 – 9,459 µg/kg
Lake Erie / Chlordane	130 µg/kg	500 - 2,188 µg/kg	2,189 – 9,459 µg/kg
Ohio River / Chlordane	310 µg/kg	500 - 2,188 µg/kg	2,189 – 9,459 µg/kg
Lake Erie / Hexachlorobenzene	29 µg/kg	800 - 3,499 µg/kg	3,500 - 15,099 µg/kg
Ohio River / hexachlorobenzene	67 µg/kg	800 - 3,499 µg/kg	3,500 - 15,099 µg/kg
Lake Erie/ mirex	88 µg/kg	200 - 874 µg/kg	875 - 3,783 µg/kg
Ohio River/ mirex	200 µg/kg	200 - 874 µg/kg	875 - 3,783 µg/kg

Values	Advisory is less protective than the WQS criterion, WQS exceeded, waterbody impaired
Values	Advisory is more protective than WQS criterion, WQS not exceeded, no impairment from FCA
Values	Advisory may be more, or less, protective than WQS criterion

[1] See Section E4 for an explanation of how these concentrations were calculated.

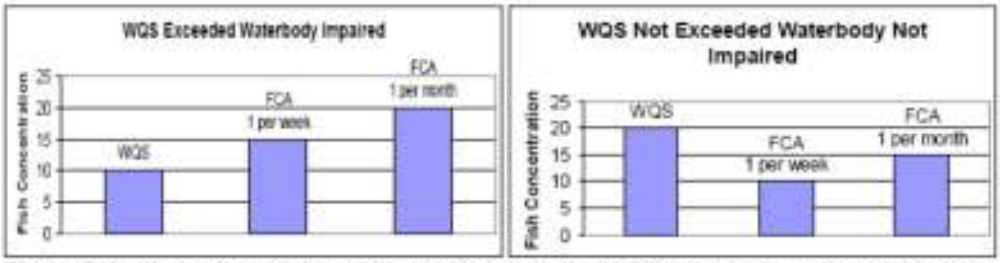


Figure E-1. Illustration of the relationship among the WQS values, the values that trigger issuance of FCAs and the resulting decision regarding waterbody impairment associated with an FCA.

Recreation: Ohio water quality standards state that Ohio may also designate a water body for recreational use (OAC 3745-1-07(A)(1)). Under the Ohio Administrative Code, recreational designations are in effect from May 1st to October 31st (OAC 3745-1-07(B)(4)). Table F-1 below, describes the methodology using the geometric mean. For bathing waters, the geometric mean *E. coli* shall not exceed 126 cfu per 100 ml in the recreational season and shall not exceed 235 cfu per 100 ml in a single sample. *E. coli* for primary and secondary contact recreation waters may not exceed the geometric mean values for these waters. Water quality standards for primary and secondary contact recreation waters do not include a single sample maximum criterion. Note Table 7-13 within Table F-1 in the OAC 3745-1-07 shows numeric criteria for several new recreational contact classifications, based on intensity of use.

Table F-1. Summary of the recreation use assessment methods.

Bathing Waters		
Indicator	Criterion (Table 7-13, OAC 3745-1-07)	Assessment Method Summary
E. coli	Seasonal geometric mean *E. coli* content* based on samples from the recreation season within a calendar year is 126 cfu/100 ml; single sample maximum is 235 cfu/100 ml.	Applied to the three Lake Erie assessment units, exceedance of the geometric mean bathing water criterion or an exceedance of the single sample maximum for more than 10% of the recreation season is considered an impairment of the bathing water use.
Primary Contact and Secondary Contact		
Indicator	Criterion (Table 7-13, OAC 3745-1-07)	Assessment Method Summary
E. coli	Seasonal geometric mean *E. coli* content* based on samples from the recreation season within a calendar year is: Primary Contact Waters Class A: 126 cfu/100 ml Class B: 161 cfu/100 ml Class C: 206 cfu/100 ml Secondary Contact Waters 1030 cfu/100 ml	Applied to streams and inland lakes. Data from a recreation season are assessed on a site-by-site basis and compared to the applicable geometric mean *E. coli* criterion whenever more than one sample result is available for a WAU. Assessment units are considered to be in full attainment if all sites assessed within the AU meet the applicable geometric mean criterion and in non-attainment if one or more sites assessed within the AU exceed the applicable geometric mean criterion.

* *E. coli* concentrations are expressed in colony forming units (cfu) per 100 milliliters (ml)

Aquatic life use: Ohio's standards contain numeric biological criteria that describe the expected biological performance of Ohio's wadeable and boatable rivers and streams. These biocriteria are codified in Ohio's water quality standards (OAC 3746-1-07, Table 7-15). Ohio EPA uses the numeric biological criteria to interpret the data generated when a biological assessment of a stream is conducted (OAC 3745-1-07(A)(6)). Through a use attainability analysis, a given stream reach may be assigned an appropriate aquatic life use. Biological sampling is conducted to establish attainment status, with further sub-classification based on ecoregion and size of waterbody. Ohio uses evidence from physical habitat surveys that include the characteristics of the stream that are critical to supporting aquatic life: 1) substrate, 2) in-stream cover, 3) channel morphology, 4) riparian zone and bank erosion, 5) pool/glide and riffle/run quality, and 6) gradient. Observed scores are compared with the target scores and a percentage deviation from the target is calculated.

Although chemical and physical data are collected as part of Ohio EPA's comprehensive watershed evaluations, the performance of the fish and macroinvertebrate communities is used to determine attainment status. Section G discusses the biosurveys that measure performance. For a sampling site to be classified as being in full attainment it must meet the relevant criteria in three indices: Index of Biotic Integrity (IBI) (fish); the Modified Index of Well-being (MIWb) (fish); and, the Invertebrate Community Index (ICI) (OEPA 1999). The chemical and physical scores are used to confirm the biological impairment or attainment determination.

Public drinking water supply: Ohio's water quality standards state that Ohio may also designate a water body for water supply use (OAC 3745-1-07(A)(1)). Ohio has three water supply uses: public, agricultural, and industrial. A public water supply is a water that with conventional treatment will be suitable for human intake and meet federal regulations for drinking water (OAC 3745-1-07(B)(3)(a)).

Section H in the 2012 Integrated Report summarizes the Public Drinking Water Supply (PDWS) assessment. Evaluation methodology includes measurement of both treated waters and source waters, using nitrate and pesticides as indicators of water quality, using annual average concentrations (except for nitrate). Nitrate values did not use average values, but rather maximum concentration, because exceedences above the maximum may cause acute health effects. The two indicators are used together, as shown in the table below from Section H of the 2012 IR, to determine the AU status for the PDWS designated use attainment.

Nitrate Indicator	Pesticide or Other Indicator	AU Assessment Status
Full support	Full support/Insufficient data	Full support
Full support	Impaired	Impaired
Impaired	Insufficient data/Full Support/Insufficient data	Impaired
Insufficient data	Impaired	Impaired
Insufficient data	Insufficient data/Full Support	Insufficient data

PDWS are designated waters within 500 yards of an active intake or waters of a publicly owned lake. Ohio EPA collected and reviewed data from public water systems for treatment methods, locations of intakes, number of reservoirs, and water quality. Ohio EPA also collected data in 2009 to better evaluate the algal toxin threat to drinking water by obtaining information on treatment processes, algae control measures, and source water treatment costs. Sampled water quality data (using average annual values for all contaminants except for nitrates) were compared to the numeric chemical water quality criteria for the protection of human health (OAC 3745-1-33 and 34).
The water quality criteria are:
1) Nitrate 10 mg/L, directly corresponding to the Safe Drinking Water Act Maximum Contaminant Level (MCL);
2) Atrazine 3.0 µg/l; and

3) *Cryptosporidium* water quality criteria are being developed, but if the annual average exceeds 1.0 oocysts/L the water is considered impaired. This value will likely be adopted as a water quality criterion before the next listing cycle.

The waters were then determined to be in full support, impaired, not assessed, or put on a "watch list", i.e., targeted for additional monitoring and assessment, applicable to any of the contaminants. Table H-1 below, from the 2012 Integrated Report, summarizes Public Drinking Water Supply impairment determination.

Table H-1. Public drinking water supply impairment determination.
Applies to in-stream ambient and treated water quality data from 2006 through December 2010.

Indicator	Impaired Conditions
Nitrate	☐ Two or more excursions[1] above the WQ criterion within the 5 year period
Pesticides	☐ Annual average exceeds WQ criteria
Other Contaminants	☐ Annual average exceeds WQ criteria
Cryptosporidium[2]	☐ Annual average exceeds WQ criterion (1.0 oocysts/L)
Indicator	**Full Attainment Conditions**
Nitrate	☐ No more than one excursion[1] above the WQ criteria within the 5 year period
Pesticides	☐ Annual average does not exceed the WQ criteria
Other Contaminants	☐ Annual average does not exceed the WQ criteria
Cryptosporidium	☐ Annual average does not exceed the WQ criterion
Indicator	**"Watch List" Conditions** *Source waters targeted for additional monitoring and assessment*
Nitrate	☐ Maximum instantaneous value > 8 mg/L (80% of WQ criterion)
Pesticides	☐ Running quarterly average ≥ WQ criteria ☐ Maximum instantaneous value ≥ 4x WQ criteria
Other Contaminants	☐ Maximum instantaneous value ≥ WQ criteria
Cryptosporidium	☐ Annual average ≥ 0.075 oocysts/L

[1] Excursions must be at least 30 days apart in order to capture separate or extended source water quality events.
[2] Impaired conditions for *Cryptosporidium* are based on water quality criteria that Ohio EPA intends to develop.
WQ Criteria - Water Quality Criteria defined in OAC Chapter 3745-1 established to protect in-stream water quality for the PDWS beneficial use (Human health - Drinking Water)

Wetlands: Section I of the 2012 IR discusses wetland evaluation. In 1998, Ohio established wetland water quality standards. These standards include provisions for wetland use designation, narrative criteria, numeric criteria for dischargers to wetlands, and antidegradation. All wetlands receive the "wetlands" use designation under OAC 3745-1-53. Narrative criteria have been codified which protect the functional and recreational aspects of designated wetlands.

In 2006, the State proposed a new rule package that included wetland numeric biological criteria that would establish benchmarks for ecological integrity as measured by vascular plants and/or amphibians. Soil survey data, an inventory of wetland resources, a landscape development index, land uses, land uses in buffer areas, historic forest and forest stability metrics, and endangered species within the buffer area will all be considered in evaluation of wetlands. Section I-1 states that although it is Ohio's intention to incorporate this information into future rules, the rule package is currently on hold.

Ohio has a wetland antidegradation rule, OAC 3745-1-54 which categorizes wetlands based on the wetlands relative functions and values, sensitivity to disturbance, rarity, and potential to be adequately compensated for by wetland mitigation. Recent reports include studies of: 1) use of wetland invertebrates as indicators; 2) Ohio wetland mitigation banks; 3) condition assessment of wetlands in the Cuyahoga River watershed; and, 4) condition and function of urban wetlands. There was also a grant to study selected mitigation wetlands around the state to compare with natural wetlands. Future studies will include associations between stream and wetland conditions and will be incorporated into future TMDL analysis of a watershed.

Ohio's proposed methodology for these future studies is to: 1) identify historic wetlands using existing land cover databases; 2) identify existing wetlands resources through use of wetland inventory data and compare existing to historical wetlands; 3) perform preliminary wetland assessment using ten metrics, resulting in poor to excellent classification; 4) identify OEPA Wetlands Ecology Group's past wetland assessment; and, 5) review site studies completed under the Wetland Development Grant.

Inland lakes and reservoirs: All lakes in Ohio are currently designated as Exceptional Warmwater Habitat (EWH) for ALU, but for the next IR, the designation will change to Lake Habitat (LH). The revision will retain the current criteria and include nutrient water quality criteria. Ohio is also monitoring 16 lakes per year, and is prioritizing sites based on public drinking water supply use or recreational use. Future lake assessment will likely include Harmful Algal Blooms (HAB) and cyanotoxins. Ammonia, Chlorophyll a, dissolved oxygen, nitrogen, pH, phosphorus, Secchi disk and temperature are being proposed as parameters for LH criteria and are listed in Table I-1 below.

Table I-1. Proposed[1] lake habitat use criteria.

Note: All criteria are outside mixing zone averages unless specified differently.

Parameter / Lake type	Form[2]	Units[3]	Statewide criteria	Ecoregional Criteria[4]				
				ECBP	EOLP	HELP	IP	WAP
Ammonia	T	mg/l	Table 43-4	--	--	--	--	--
Chlorophyll a[5]								
Dugout lakes	T	µg/l	6.0	--	--	--	--	--
Impoundments	T	µg/l	--	14.0	14.0	14.0	14.0	6.2
Natural lakes	T	µg/l	14.0	--	--	--	--	--
Upground reservoirs	T	µg/l	6.0	--	--	--	--	--
Dissolved oxygen[6] All lake types	T	mg/l	5.0 OMZM 6.0 OMZA	--	--	--	--	--
Nitrogen[5]								
Dugout lakes	T	µg/l	450	--	--	--	--	--
Impoundments	T	µg/l	--	930	740	930	688	350
Natural lakes	T	µg/l	638	--	--	--	--	--
Upground reservoirs	T	µg/l	1,225	--	--	--	--	--
pH								
All lake types	--	s.u.	A	--	--	--	--	--
Phosphorus[5]								
Dugout lakes	T	µg/l	18	--	--	--	--	--
Impoundments	T	µg/l	--	34	34	34	34	14
Natural lakes	T	µg/l	34	--	--	--	--	--
Upground reservoirs	T	µg/l	18	--	--	--	--	--
Secchi disk transparency[7]								
Dugout lakes	--	m	2.60	--	--	--	--	--
Impoundments	--	m	--	1.19	1.19	1.19	1.19	2.16
Natural lakes	--	m	1.19	--	--	--	--	--
Upground reservoirs	--	m	2.60	--	--	--	--	--
Temperature								
All lake types	--	--	B	--	--	--	--	--

1 Proposed in draft water quality standards rules, August 2009.
2 T = total.
3 m = meters; mg/l = milligrams per liter (parts per million); µg/l = micrograms per liter (parts per billion); s.u. = standard units.
4 ECBP stands for Eastern Corn Belt Plains; EOLP stands for Erie/Ontario Lake Plain; HELP stands for Huron/Erie Lake Plains; IP stands for Interior Plateau; and WAP stands for Western Allegheny Plateau.
5 These criteria apply as lake medians from May through October in the epilimnion of stratified lakes and throughout the water column in unstratified lakes.
6 For dissolved oxygen, OMZM means outside mixing zone minimum and OMZA means outside mixing zone minimum twenty-four-hour average. The dissolved oxygen criteria apply in the epilimnion of stratified lakes and throughout the water column in unstratified lakes.
7 These criteria apply as minimum values from May through October.
A pH is to be 6.5-9.0, with no change within that range attributable to human-induced conditions.
B At no time shall the water temperature exceed the average or maximum temperature that would occur if there were no temperature change attributable to human activities.

Removal of Waters from the 303(d) List

Section J of the 2012 IR describes the delisting of waters from the 2010 303(d) list. As provided in 40 C.F.R. § 130.7(b)(6)(iv), U.S. EPA requested that the State demonstrate good cause for not including these waters on its 2012 Section 303(d) list.

Table J-5 below shows both delisting and listing of new waters. There are 260 delistings and 244 new listings, primarily in watershed assessment units. U.S. EPA concurs with the reasons for the changes because Ohio has demonstrated good cause, as discussed in the following sections.

Table J-5. Number of assessment units removed from or added to the 303(d) list.

	Number of Assessment Units			
	Watershed	Large River	Lake Erie	*Total*
Delistings				
Human Health (fish tissue)	5	0	0	*5*
Recreation	79	3	0	*82*
Aquatic Life	171	1	0	*172*
Public Drinking Water Supply	1	0	0	*1*
Total	*256*	*4*	*0*	*260*
New Listings				
Human Health (fish tissue)	10	1	0	*11*
Recreation	175	6	0	*181*
Aquatic Life	48	4	0	*52*
Public Drinking Water Supply	0	0	0	*0*
Total	*233*	*11*	*0*	*244*

-Waters Meeting Water Quality Standards

The State's decision not to include some AUs on its 2012 Section 303(d) list, also shown in Section J and Table J-6 below, is consistent with U.S. EPA regulations at 40 CFR 130.7(b)(6)(iv). Under 40 CFR 130.7(b)(6)(iv), States are not required to list if the waters meet water quality standards based on more recent data. These waters were individually identified on the State's 2012 Section 303(d) list, due to 1) methodology change, 2) a flaw in original listing, 3) new data (meeting water quality standards), or 4) TMDL approval, as shown in Tables J-7, J-8, J-9 and J-10, respectively. The tables are incorporated into this document by reference.

Table J-6. Summary of reasons for changes to the 2012 303(d) list.

	Number of Assessment Units	
Reason for Change	Removals	Additions
Change in methodology (2010 AU size)	55	1
Flaw in original listing	5	6
New data	63	237
TMDL approved	137	--

-Waters Removed Based on TMDL Approval

The State's decision not to include AUs on its 2012 Section 303(d) list is consistent with EPA regulations at 40 CFR130.7(b)(6)(iv). Under 40 CFR 130.7(b)(6)(iv), States are not required to list waters if all impairments are addressed in an approved TMDL. These waters were identified on the State's 2012 Section 303(d) list in Section J, Table J-10, with a change from Category 5 (the list) to Category 4A (approved TMDL). Table J-10 provides the designated use, the AU number and name. Table J-6 above shows the change in listing status and total changes based on reasons for the changes.

Waters Subject to Other Pollution Control Requirements Stringent Enough to Implement any Water Quality Standards, 40 CFR 130.7(b)(1)(iii)

Under 40 C.F.R. 130.7(b)(1), States are required to list WQLSs still requiring TMDLs where effluent limitations required by the CWA, more stringent effluent limitations required by State, local, or federal authority, or other pollution control requirements required by state, local, or federal authority, are not stringent enough to implement any applicable water quality standards. The regulation does not specify the time frame in which these various requirements must implement applicable water quality standards to support a State's decision not to list particular waters.

Monitoring should be scheduled for these waters to verify that the water quality standard is attained as expected in a reasonable time frame. Where standards will not be attained through implementation of the requirements listed in 40 C.F.R. 130.7(b)(1) in a reasonable time, it is appropriate for the water to remain on the Section 303(d) list to ensure that implementation of the required controls and progress towards compliance with applicable standards is tracked. If it is determined that the water is, in fact, meeting applicable standards when the next Section 303(d) list is developed, it would be appropriate for the State to remove the water from the list at that time.

Section L6 of the 2012 IR describes several projects addressing impairments and achieving water quality standards without a TMDL, classified as category 4B: "impaired, other required control measures will result in attainment of use." Locations will be monitored for potential removal from the list in the next listing cycle (see table below). In the 2010 IR, only the Salt Creek Watershed was listed as 4B.

Name of Watershed	Location of 4B in Report	Date of TMDL Approval	Locations of Updates in 2012 IR
Salt Creek Watershed (Scioto River basin)	Appendix D	8/12/2009	6.1.1.1
White Oak Creek Watershed	Appendix H	2/25/2010	6.2.1.1
Twin Creek Watershed	Appendix B	3/4/2010	6.2.2.1
Walnut Creek Watershed	Appendix B	5/4/2010	6.2.3.1

Public Participation and Comments on Listing Decisions

The State's public participation process for the 2012 Integrated Report has been extensive. On June 6, 2011, a mailing was sent to all Level 3 qualified data collectors, including major NPDES discharge permit holders, those who had formerly submitted Level 3 chemical, biological and/or physical data. Details of Level 3 Qualified Data Collector requirements are described in OAC Rule 3745-4-03(A)(4). Qualifications include a minimum of two years of practical experience in

the following assessment categories: stream habitat assessment, fish community biology, benthic macroinvertebrate biology and/or chemical water quality assessment. (See Section D5.1, Table D-3, hereby incorporated by reference, listing the entities, data dates and data descriptions in the 2012 IR). On December 28, 2011, the State posted an announcement of its draft of the 2012 Integrated Report available on its public website (Section D5.2 of the 2012 IR), including instructions for printed copy requests. The formal comment period for the 2012 Integrated Report was from December 28, 2011 to February 6, 2012. The Notice is included in the 2012 Integrated Report in Section D5.3. Public comments received and Ohio EPA's responses are included in Section D6; responses to U.S. EPA comments were addressed and incorporated into the 2012 Integrated Report.

During the public comment period the State received many comments that expressed concerns about several topics, including the increasing algae and nutrients in Lake Erie, wetlands, Grand Lake St. Marys, inland lakes, mercury and PCBs. The State responded to all of the public comments and addressed its decisions to not consider certain data, or to list certain waterbodies on its 2012 Section 303(d) list. Some of the comments resulted in changes to the text in the final 2012 Integrated Report. The State has adequately addressed comments received and has demonstrated, to U.S. EPA's satisfaction, good cause for its listing decisions in the 2012 Section 303(d) list.

Priority Ranking and Targeting

U.S. EPA also reviewed the State's priority ranking of listed waters for TMDL development, and concludes that the State properly took into account the severity of pollution and the uses to be made of such waters, as well as other relevant factors such as status of recreation use, and the status of aquatic life. For near shore watershed areas of Lake Erie the waterbodies were assigned the same priority as the surrounding contiguous watersheds. Ohio defers to the U.S. EPA for prioritization of open waters of Lake Erie and to ORSANCO for the Ohio River. These waterbodies have low priority ranking for Ohio EPA initiated action, although many actions funded by U.S. EPA have been initiated and are underway in the Ohio River and in contributing watersheds to Lake Erie, including the Maumee, Sandusky, and Lower Grand watersheds.
For the remaining waters in Category 5 of the Integrated Report, the State used a point system to determine the priority ranking of the AUs. Ohio EPA's point system is based on a maximum of 20 possible points (1 being the lowest priority and 20 being the highest priority, including categories of assigned points and extra points). The points were distributed as follows, and can be found in Section J2 and Table J-3 of the 2012 Integrated Report.

Table J-3. Priority points for impaired assessment units.

Points	Condition	# Assessment Units	
		WAUs	LRAUs
Human Health Use impairment (fish tissue contaminants) (maximum of 3 points)			
2	Listed as impaired for Fish Contaminants (Human Health Use)	493	30
+ 1	Additional point in assessment units that have greater than 500 parts per billion PCBs or mercury	15	5
Recreation Use impairment (maximum of 6 points)			
1	Listed as impaired, with assessment unit score[1] between 0 and 25	51	1
2	Listed as impaired, with assessment unit score[1] between 75.1 and 100	75	10
3	Listed as impaired, with assessment unit score[1] between 25.1 and 50	148	1
4	Listed as impaired, with assessment unit score[1] between 50.1 and 75	151	3
+ 2	Additional points if assessment unit contains Class A waters	76	15
Aquatic Life Use impairment (maximum of 4 points)			
1	Listed as impaired, with assessment unit score[1] between 0 and 25	242	4
2	Listed as impaired, with assessment unit score[1] between 75.1 and 100	46	10
3	Listed as impaired, with assessment unit score[1] between 25.1 and 50	122	1
4	Listed as impaired, with assessment unit score[1] between 50.1 and 75	127	2
Public Drinking Water Use impairment (maximum of 7 points)			
5	Listed as impaired for Public Drinking Water Use for one indicator	4	3
+ 2	Additional points in assessment units impaired for second indicator	2	2
1	Not listed as impaired, but on watch list; one point for each indicator	31	3

[1] The assessment unit score is reported on the summary sheets in Section L and on the assessment unit summaries on the web.

In addition, U.S. EPA reviewed the State's identification of WQLSs targeted for TMDL development in the next two years, and concludes that the targeted waters are appropriate for TMDL development in this time frame. Ohio considered various factors in developing both the long term and short term schedule.

Ohio builds on programmatic strengths in monitoring, modeling, permitting, and nonpoint source incentives to develop an integrated approach to TMDLs that aligns program goals and resources efficiently. Ohio also has an active stakeholder process for developing TMDLs. Ohio works on collecting data through the five-year rotating basin plans. Ohio's ALU data are valid for up to ten years for evaluating assessment units, so each AU must be monitored at least once every ten years. Each AU is assigned to one of the next two monitoring cycles using the following criteria: Ohio EPA's five-year Basin Monitoring Strategy; time since most recent assessment; distribution of work effort among Ohio EPA district offices; priority ranking; and TMDL schedule. Ohio has generated its long-term TMDL schedule based on local interest, funding and partnership potential. Some flexibility remains in long-term scheduling because it is difficult to predict these variables.

Table J-16 in Section J of the 2012 Integrated Report is the short-term schedule for TMDL Development and is hereby incorporated by reference.

Long term schedule

U.S. EPA has received Ohio's long-term schedule for TMDL development for all waters on the State's Category 5 list of impaired waters. As a policy matter, U.S. EPA has requested that states provide such schedules.[2] Ohio has provided information for the long term schedule in Section J5.2 of the 2012 IR. Ohio states that the five-year basin approach provides the foundation for most monitoring, and aquatic life use monitoring data up to ten years old are valid. However, due to decreased resources, cycling through the entire basin rotation would take about 15 to 20 years at current resource levels. Therefore the AUs are assigned to one of the three cycles based on the five-year basin approach, the time since last assessment, workload distribution among OEPA district offices, priority ranking, and the TMDL schedule. U.S. EPA is not taking any action to approve or disapprove this schedule pursuant to Section 303(d).

[2] See Memorandum from Robert Perciasepe, Assistant Administrator for Water, to Regional Administrators and Regional Water Division Directors, "New Policies for Developing and Implementing TMDLs", August 8, 1997.

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